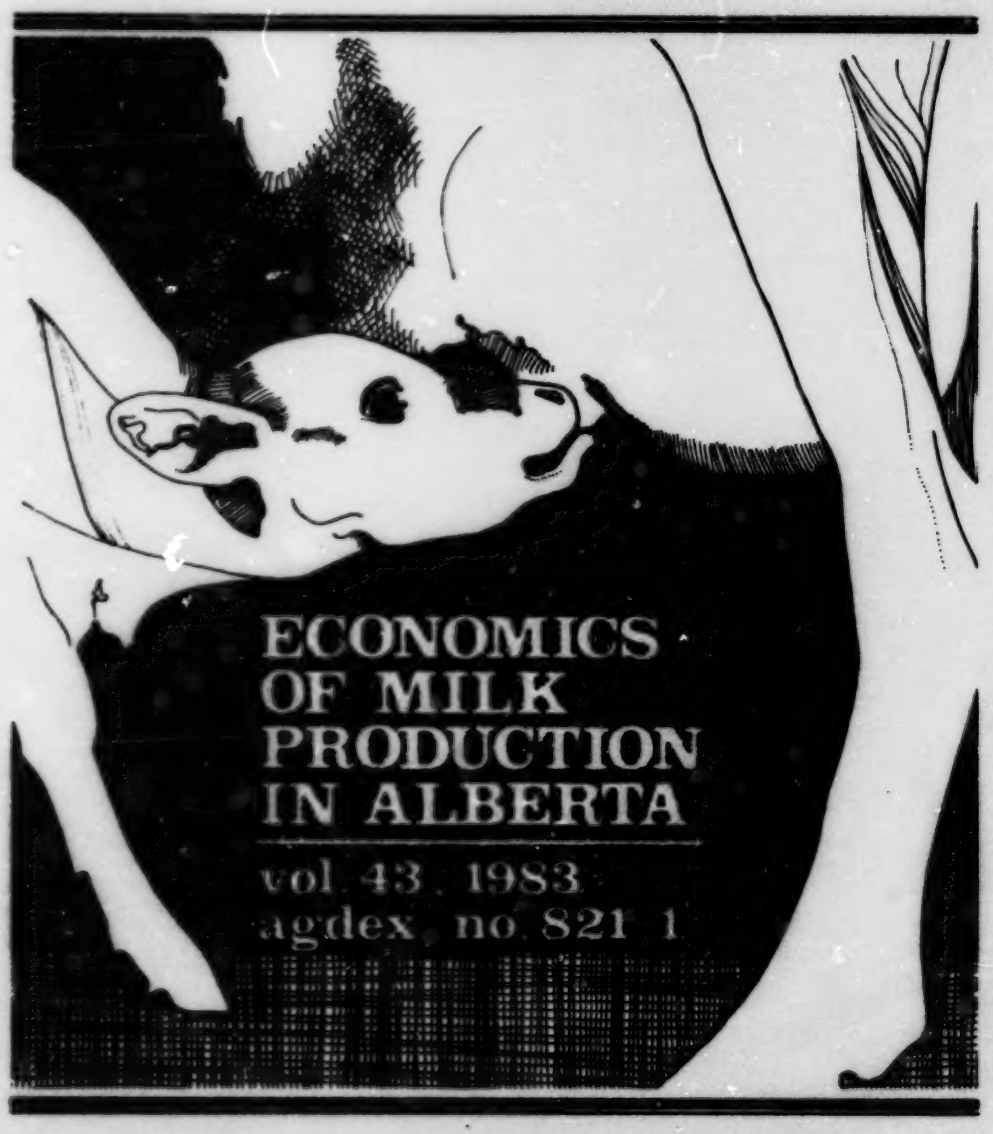

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ECONOMICS OF MILK PRODUCTION IN ALBERTA, 1983

Volume 43

By
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Production Economics Branch
Economic Services Division
Alberta Department of Agriculture
April, 1984

FOREWORD

Pricing of fluid milk in Alberta is regulated by the Public Utilities Board (PUB). The Production and Resource Economics Branch conducts an annual study of dairy production costs and returns in Alberta to assist the PUB in administering fluid milk prices. This annual Dairy Cost Study was introduced during World War II and is now recognized by dairymen, consumers and the PUB as the primary reference for setting fluid milk prices.

In addition to the Dairy Cost Study, the branch has developed a computerized formula which monitors producer costs monthly. The formula enables the PUB to make more frequent adjustments to the producer price in response to rapidly increasing production costs. Further adjustment to the producer price can be made when the annual Dairy Cost Study is completed.

Although the cost increases in 1983 were moderate (6.2%) the blend price for all milk sold has remained very stable as a result of a downward trend in fluid milk utilization. This resulted in a reduction in producer return in 1983.

Dr. Carlyle Ross
Head
Production and Resource Economics Branch

NOTE

This report was prepared from farm records of a selected number of fluid milk producers in Alberta who voluntarily participated in this project. Their participation was greatly encouraged by the Alberta Fluid Milk Producers' Association. The Alberta Dairy Control Board provided the financial compensation to the participating producers. Allan Presiznuk from Production and Resource Economics Branch collected and assisted with the computerization of the farm data and has maintained personal contact with the producers throughout the year.

Rudy Susko

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I. INTRODUCTION

This study is an annual economic analysis of milk production on Alberta farms. Prior to 1974 the findings of these studies were used as documented evidence at the Public Utilities Board hearings to set the producer price. After the inception of the formula pricing in November 1974 the significance of this study in overall pricing mechanism, however, has not diminished.

More specifically the objectives of the study are:

- to provide a continuing account of the costs and economic conditions encountered in the production of fluid milk in Alberta.
- to annually monitor the performance of the fluid milk formula pricing.
- to use the findings as a basis for the revision in the formula price.
- to provide the data for the extension use e.g. credit, farm management.
- to provide the participating dairy farmers with a personal business analysis for management purposes.

The cost of production account is a vital economic indicator in milk pricing because of the supply management nature of the industry.

II. METHOD OF ANALYSIS

Many approaches may be used to establish the cost of production on the farm. The approach taken in this study is to show the actual cost outlays taken from the farm records for a given production year. A computer program is utilized to summarize the data and calculate the weighted group averages.

The study emphasizes the overall provincial situation supported by the regional data. Since the study is annual and ongoing the current year is compared with the previous year to make the results more meaningful. Using this approach, the information is expressed in production units such as per hectolitre of milk and per cow.

Preliminary quarterly analyses are made during the year to observe seasonal effects. However, emphasis is on the full year's operation.

1. Enterprise Identification -- There are many accounting approaches for calculating the farm cost of producing fluid milk. Some use the total farm approach, with dairy costs intermingled with others. Others use the different imputed cost items such as operating interest cost or management charge. In Alberta the dairy enterprise is defined as all activities associated with milking cows, dry cows and young dairy stock. In most cases, the dairy operator raises his own feed; the inputs of production are allocated to the dairy enterprise and the total farm according to the actual use. Consequently, the final costs of producing milk are the true costs associated only with milk production.

2. Inventory Adjustment -- Since the cost of raising young dairy stock is included in the cost of milk production, the total income includes net cattle sales and net inventory increases to show the herd growth. The cattle inventory increases are determined by subtracting the beginning year inventory from the year-end inventory. The gross income is thus composed of milk sales and inventory adjustment. If the inventory adjustment per hectolitre of milk is excluded from the income the result is the blend price and subsidy received for milk.

3. Home Grown Feed — The hay is grown on the farm and fed to dairy livestock is valued at regional values of hay in the stack on the farm; feed grain is valued at elevator prices provided by the Alberta Grain Commission. Although hay and grain could be grown on the same farm, both are considered to be purchased from the crop enterprise. The total value of home grown feed is determined by applying the regional price to the actual quantity fed. The procedure adequately compensates for the production cost of growing home feed. The cost of purchased feed is accepted at the actual value spent each month.

4. Value of Investment and Depreciation — The cost of production and other relevant data from this report are supposed to reflect the average conditions in the industry. The value of depreciation is based on the original value of buildings and machinery. There is also a need to estimate the current market value of the facility to determine the equity position. The market value is computed from the original value of dairy capital by updating with the inflation factors and then depreciating according to the number of years in use. This value is used for calculating the return to equity. The age of the facility is indicated by the sample of participating producers representing the total industry. The farmland is not considered as a dairy investment. Only the acreage for dairy buildings and corral location is included in the dairy. The dairy livestock inventory is valued at the prevailing market prices at the beginning of the year.

5. Imputed Costs — There are two basic alternatives to value the economic well being of the farm enterprise. A. to determine the return to family labour including the operator labour input, and B. to determine the return to equity invested in each particular enterprise. The methods, as identified in Table 1, are quite compatible and in each case some major assumptions must be made. In alternative A. where the residual is return to family labour the equity interest must be imputed in order to arrive at the total cost of production. The actual residual can then be measured in terms of

dollars per hour of labour. On the other hand, using alternative B. the value of family labour must be imputed since there is usually no value attached to this input.

In this study the principles of the alternative B. are used, i.e. the objective is to determine the return to equity in terms of percentage return. The imputed value of family labour is included in the operating or variable costs. This is more practical for a number of reasons: i) incorporated farms usually allocate total labour expenses including family, ii) in reality the operator is using money during the year for living expenses and thus the imputed family labour value is compensating for this, iii) imputed interest or opportunity cost on equity, used in alternative A. is a controversial issue in the period of persistent inflation of capital assets. The charges for rent are included in the cost of capital. The capital cost in this context represents the cost of ownership of resources. If resources are rented there is a charge for their use; on the other hand if resources are owned the owner must bear the cost of depreciation and interest on debt. For group averages such classification of variable (or operating) and capital cost is very suitable.

a) Operator and family labour: the operator's actual labour may vary from almost nil on some dairy farms to the total input of labour on others. Our procedure has been to obtain a statement of the operator's labour in hours per month, then apply the rate paid for full time dairy labour (including room and board).

   In determining the hourly value, 2500 hours is considered to be the working time for one man-equivalent in a 12-month period. By this method, it is felt that the process of valuing the operator's labour is equitable. This method is preferred over leaving it as a residual because of the great variability in labour time between operators. Family labour is evaluated similar to the above, but with different wage rates according to age and working responsibilities.

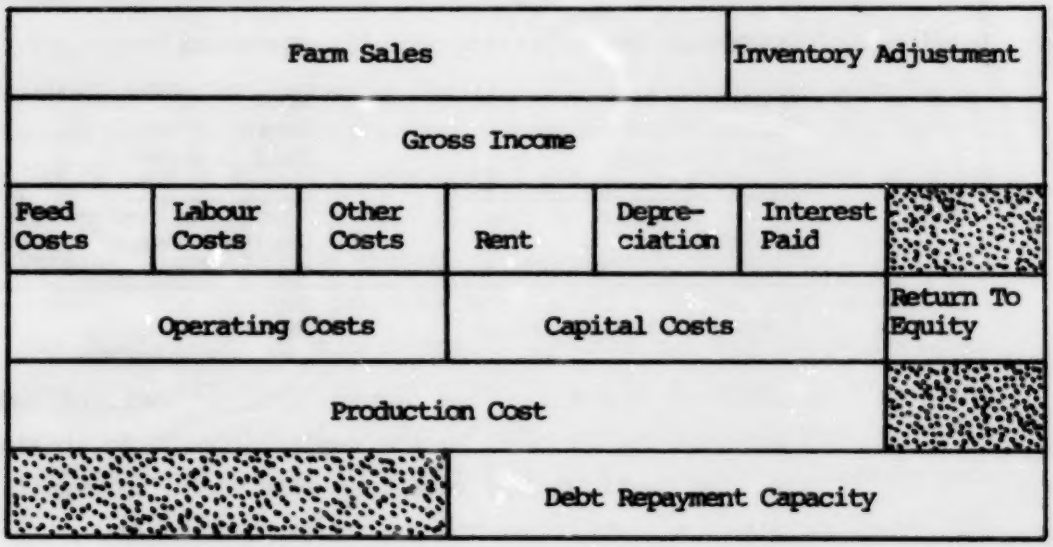
TABLE 1 ALTERNATIVE RETURNS

A. LABOUR		B. CAPITAL	
a)	Gross Income	a)	Gross Income
	Feed		Feed
	Other		Other
	Hired Labour		Hired Labour
	-		Family Labour (imputed)
b)	Operating Cost	b)	Operating Cost
	Rent		Rent
	Depreciation		Depreciaton
	Paid Interest		Paid Interest
	Equity Interest (Imputed)		-
c)	Capital Cost	c)	Capital Cost
	Return to Family Labour		Return to Equity

b) Interest on Capital: the actual interest paid on existing liabilities is included in the capital cost. To obtain this value the participating producers were asked to report their outstanding liabilities and the interest rates they paid. This method is more accurate than reporting the annual interest payment sum. The total operating cost, plus the capital cost, account for total enterprise outlays and if subtracted from the gross income, the bottom line residual is the return on equity. The return on equity is not imputed but is left as a residual to measure the economic well-being of a farmer. If this residual is expressed as a percentage of the equity capital, then the actual return on equity could be compared with some alternative opportunity income which could be expected from Canada Savings Bonds or term deposits.

6. **The production cost concept:** The concept of cost accounting in farming is not the same in all provinces. In Alberta, the following production cost concept is used:

DIAGRAM 1



III. DATA COLLECTION

In order to obtain accurate dairy information from primary milk producers, all producers on the study are required to complete a detailed questionnaire of their dairy production activities each month. This questionnaire is shown in Appendix D of this report.

Research assistants collect the data, monitor the monthly collection and audit the data. This procedure ensures promptness in data collection and a minimum of recording error. The information is then entered into the computer. The computer output shown in Appendix A, B and C serves as supporting data for the report.

The analysis is based on data from fluid milk producers. Consequently the results indicate the cost level of producing fluid milk rather than industrial. The cost level for industrial milk might differ from fluid, but the difference is not substantial.

Fifty-seven dairy producers across the province submitted business information for the calendar year 1983. Two regions are recognized for the purpose of analysis. The region lying north of 39th township is called Northern Alberta and is represented by 33 producers; the region south of the 39th township is referred to as Southern Alberta and is represented by 24 producers. The producers submitted business accounts throughout the year.

Sample — While the number of participants can change because of unforeseen circumstances, the sample size is determined statistically every year. It was established that the variance of cost of producing milk in the population of fluid milk shippers was \$3.75/hL. The desired variation was assumed to be 20 cents. The sample size was then determined by:

$$n = \frac{4 \times s^2}{L^2} \div \left(1 + \frac{n}{N}\right)$$

Where: n is sample size
N is population size
s is standard deviation of population
L is expected accuracy of sample.

The study was designed to represent a cross-section of the producers by the milk quota size. The provincial fluid milk shippers were arranged according to the quota size from largest to smallest in each of the two regions, Southern Alberta and Northern Alberta. The sample was selected by systematic sampling to provide better representation of the population. The average quota and herd size of the sample was 649 litres and 55 cows respectively. The sample size of 70 producers was determined to be statistically sufficient to represent the total population of fluid milk shippers. Out of that group 57 producers completed reports for the 12-month period needed for the study.

Production Conditions[1]

After a relatively mild winter, livestock were reported in good to excellent condition throughout Alberta. Most producers had sufficient feed reserves to continue feeding their cattle and allow pastures to get a good start. Few calving problems were reported. Lice infestations were common in the Bonnyville, Athabasca, Morinville and Barrhead areas early in the spring.

Drought in May and early June seriously limited hay and pasture growth. Few producers took off a timely first cut hay crop because the growth was so light. Rain during the last part of June and most of July improved pasture and hay growth but made haying operations difficult. As a result, first cut hay crops caused a lot of standing water. This resulted in large mosquito populations which were so bothersome to cattle that in some cases their weight gains were reduced.

Prolonged dry conditions in the Pincher Creek-Cardston areas of the Southern Region and the Oyen-Scapa areas of the South Central Region reduced hay yields for these districts. The remainder of Alberta had good to excellent hay yields with a combined provincial average yield of 1.95 tons/acre. Provincially, hay quality was generally good, although second cuts had better overall quality. Winter hay

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1 As reported by Statistics Branch of Alberta Agriculture.

supplies have been supplemented with greenfeed and silage. In addition, some producers in central and northern areas put up weedy crops that were never sprayed. There were also good supplies of feed grains available throughout Alberta.

An open fall and some early harvested fields provided cattle plenty of opportunities for fall grazing. By the end of October winter feeding had commenced in several areas. Livestock producers prepared well for winter and reports indicated they had adequate to surplus feed supplies for the 1983-84 winter.

IV. ANALYSIS OF RESULTS

Milk Prices

The program of supply management of fluid milk in Alberta is administered by the Alberta Dairy Control Board. Fluid milk quotas held by the producers are assigned by the Board to the processing plants. The minimum fluid milk prices at farm, wholesale and retail levels are established by an independent Board of Public Utilities (PUB). The PUB uses a fluid milk price formula to establish the monthly farm price. The retail price increases in 1983 resulted from changes in the producer price as indicated by the price formula,[1].

TABLE 2 FLUID MILK PRICE INCREASES IN 1982

Effective Date	Producer Price $/hL	Wholesale Price $/L	Retail Price $/L
January 1, 1983	45.19	75	79
February 1, 1983	46.17	76	80
September 1, 1983	47.15	77	81
Average	46.42	76.25	80.25

Fluid milk sales decreased in 1983 by 2.9 per cent over the 1982 sales of 266.3 million litres. The utilization of assigned fluid milk quota in 1983 was 76.3 per cent compared to 80.1 per cent in 1982.

Fluid milk producers shipping milk in excess of designated Class 1 (fluid) milk received a $6.04 per hectolitre (hL) subsidy if the milk was covered by national market share quota. The subsidy was paid in addition to industrial milk prices. Of this subsidy, the Canadian Dairy Commission (CDC) held back a levy of $5.14 per hectolitre to pay

[1] The Alberta milk price formula was first adopted in November 1974; there was a major revision on July 1, 1980. The concise description of the formula is given in the Appendix E.

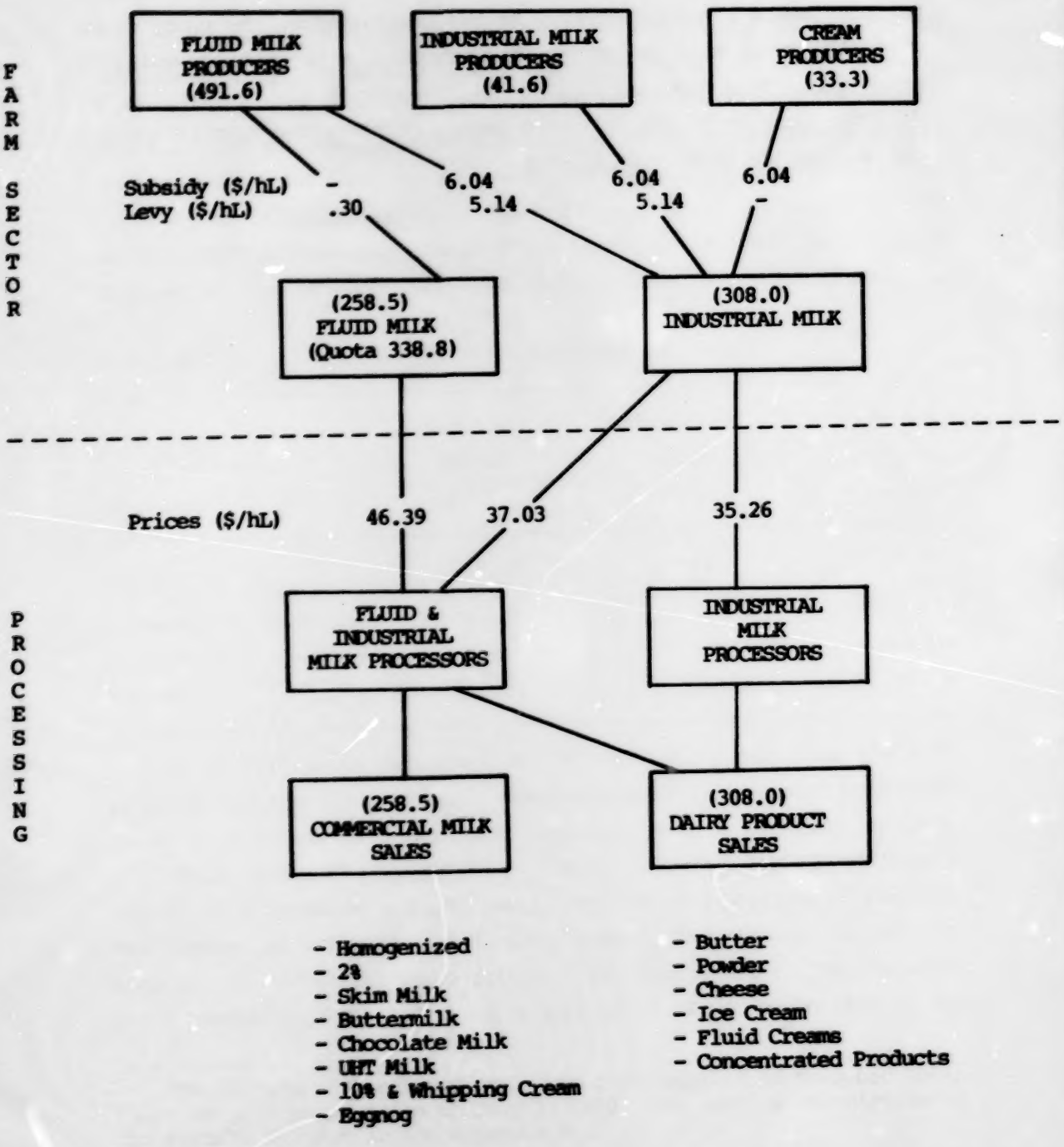
some expenses of exporting dairy products. In addition to the levy, the CDC continued to impose a 30-cent levy on fluid milk deliveries.

The industrial milk production also decreased in 1983 compared with previous years. Shipment of 308.0 million litres in 1983 was 2.2 per cent below the 1982 level. At the conclusion of the year, there were 1420 fluid milk shippers, 284 industrial milk shippers and 1558 cream shippers in Alberta.

The diagram on the following page summarizes the quantity, price and utilization of milk in Alberta.

DIAGRAM 2

- 1983 Milk in million litres
- Prices are 1983 averages



- Homogenized
- 2%
- Skim Milk
- Buttermilk
- Chocolate Milk
- UHT Milk
- 10% & Whipping Cream
- Eggnog

- Butter
- Powder
- Cheese
- Ice Cream
- Fluid Creams
- Concentrated Products

Input Prices

Table 3 shows the value and average price of the three most significant inputs: capital, labour and feed.

The market value of depreciable investment was calculated by using the inflation factor to update the original value of the asset and then depreciating according to the years of use.

Wages represent payment for the work required for the dairy enterprise. Fully paid family workers were considered to be hired labour. The wage rate for hired labour was the actual wage rate paid by participants in the study. Hired labour rates exclusive of family arrangements within the study sample as well as a random sampling of wage rates on dairy farms outside the study sample, were used to determine operator labour rates. The imputed value for an operator's labour in 1983 was $7.23 per hour. Compared with the previous year, purchased concentrate was used more than home-grown. The situation on roughage feeding was reversed. The use of family labour over hired help was more evident in 1983 than year before. The 1983 prices for listed inputs were higher than 1982.

TABLE 3 CAPITAL, LABOUR AND FEED VALUES

	Per Farm	Per Cow	Average Price
	------ Dollars ------		
Depreciable Investment	124,808	2,281	-
Livestock Investment	101,185	1,849	1,366/cow
Total Investment	231,752	4,236	-
Grain & Concentrate Value:			
Home Grown (35%)	4,683	85.6	85.2/tonne
Purchased (65%)	18,122	331.2	175.7/tonne
Roughage Value:			
Home Grown (79%)	17,741	324.3	72.4/tonne
Purchased (21%)	5,341	97.6	81.1/tonne
Labour Value:			
Hired (26%)	5,683	103.9	5.06/hour
Operator & Family (74%)	22,258	406.8	6.79/hour

Income

Table 7 portrays the cost of producing milk for the dairy enterprise in Alberta; for comparison Table 8 and 9 display the results of Northern and Southern regions respectively. Gross income is the sum of milk sales and value for inventory adjustment. Value per hectolitre of milk sold or blend price received for milk remained almost unchanged over the previous year. Although the fluid milk price has increased twice in 1983 the increases were diluted by lower fluid sale utilization and increased levies. The blend price for all milk sold was $43.83 per hectolitre in 1983 and $43.28 in 1982. Milk production of 5,705 litres for cow increased only slightly over the 5,671 litres a year before.

Inventory adjustment or the value for herd growth increased in 1983 by almost $20.00 per cow to $152, or $2.74 per hectolitre of milk. Total gross income per hectolitre of milk sold averaged $46.56 up from $45.67 in 1982.

Production Costs

The total production cost in 1983 was $2,276 per cow or $41.62 per hectolitre. From this amount the capital and variable costs accounted for 15.5 and 84.5 per cent respectively. The total production cost in 1983 increased by 6.2 per cent compared with the 1982 production year. While the variable costs such as feed and labour increased only moderately, the largest increase occurred in capital cost category and specifically interest payments. This could be explained by lower rental costs in the 1983 sample compared with 1982. In 1983 the debt accounted for 35 per cent of total assets, while this was only 28 per cent in 1982.

TABLE 4 COST STRUCTURE

	Northern Region	Southern Region	Alberta
Feed Costs	32.2	36.6	34.1
Labour Costs	19.1	19.6	19.8
Other Costs	22.0	21.7	21.9
Capital Costs	14.1	13.1	13.6
Return	12.7	9.0	10.6
TOTAL (Per Cent)	100.0	100.0	100.0

Returns

Although the cost increases in 1983 were moderate the blend price for all milk sold has remained very stable as a result of a downward trend in fluid milk utilization. This resulted in a reduction in producer return on equity to $303 per cow from $358 a year before. If expressed in terms of per cent return on equity the rate was reduced from 12 per cent to 10 per cent in 1983.

TABLE 5	RETURN TO CAPITAL	Per Cow
Total Dairy Investment	(100%)	$4,236.00
Debt	(35%)	$1,483.00
Equity	(65%)	$2,753.00
Paid Interest Rate		9.9%
Equity Interest Rate		10.0%
Profit per cent of Sales		11.8%

Other economic measurements of dairy farms in 1983 like profit per cent of sales and return to family labour were also below the 1982 level. The profit per cent of sales was 11.8 in 1983, down from 14.2 in 1982 and the return to family labour of $5.88 per hour was down from $6.33 in 1982.

Although the returns on dairy farms were below the 1982 levels, the dairy sector remained relatively better off in comparison with other farm sectors. The provincial supply of milk exceeded the expected requirements.

Table 6 illustrates the acceptable total debt load per cow at various levels of milk production and interest rates. The basic repay-

ment capacity is given by gross return i.e. money available for resource ownership payment, consisting of rent, depreciation, paid and equity interest ($656 per cow). This table should be used as a guideline only, each individual situation is different.

TABLE 6 ACCEPTABLE TOTAL DEBT LOAD PER COW

MILK PRODUCTION / INTEREST RATE*	10 %	11 %	12 %	13 %	14 %	15 %
4,500 (L/cow)	3763	3520	3301	3105	2927	2767
5,500	5270	4929	4624	4348	4100	3875
6,000	6036	5646	5296	4981	4696	4438
6,500	6785	6347	5953	5599	5279	4989
7,000	7543	7055	6618	6224	5868	5546

* At 20 Years Repayment Period.

Price Formula Comparison With Cost Study Results

Table 10 compares the 1983 cost study with the results of the formula price. The composite index of the formula was responsible for an increase of 3.7 per cent in the Class 1 price, which in turn contributed to the increase in the effective blend price received by the producers. The supply factors of the formula increased by a moderate 2.65 per cent over the previous year, while the estimated cost of production increased by 6.2 per cent. The increase in the cost of production coupled with reduced fluid utilization were primarily responsible for lower profit or return to equity in 1983 compared with 1982.

The results indicate that the change in cost indices, used in the formula, differed slightly from the actual cost change found in the study. The deviation may be attributed to an inherent limitation of any formula indexing; for instance lack of reflection of the production seasonality or the fact that the comparison was made in terms of the previous year only.

In conclusion, the increase in the 1983 Class 1 milk price as established by the formula was slightly below the actual production cost increase. The percentage difference amounted to only 90¢ per hectolitre.

TABLE 7 COST OF PRODUCING MILK

Alberta Average	1982	1983
No. of Cows	57.3	54.7
Milk Production Per Cow (L)	5671	5705
Capital Investment per Cow ($)	4126	4236
	Per Cow	
Milk Sales	2399.51	2427.58
Inventory Adjustment	132.43	151.57
A. GROSS INCOME	2531.94	2579.15
Concentrate	407.96	425.61
Roughage	436.09	452.64
Other Costs	538.90	534.39
Hired Labour	120.00	103.88
Family Labour	354.21	406.85
B. Variable Costs	1857.16	1923.37
Rent	48.31	18.31
Depreciation	170.71	186.11
Interest	97.46	148.13
C. Capital Cost	316.48	352.55
D. Production Cost (B+C)	2173.64	2275.92
GROSS RETURN	674.78	655.78
RETURN TO EQUITY	358.30	303.23
	Per hL of Milk Sold	
Milk Sales	43.28	43.83
Inventory Adjustment	2.39	2.73
A. GROSS INCOME	45.67	46.56
Feed Costs	15.22	15.86
Other Costs	9.72	10.18
Labour Cost	8.55	9.22
B. Variable Cost	33.49	35.26
Rent	0.87	0.33
Depreciation	3.08	3.36
Interest	1.76	2.67
C. Capital Cost	5.71	6.36
D. Production Cost	39.20	41.62
RETURN TO EQUITY	6.47	4.94
PER CENT RETURN TO EQUITY (%)	12.04	10.01

TABLE 8 COST OF PRODUCING MILK

Northern Alberta Average	1982	1983
No. of Cows	53.5	53.6
Milk Production Per Cow (L)	5556	5593
Capital Investment per Cow ($)	3971	4271
	Per Cow	
Milk Sales	2347.35	2377.81
Inventory Adjustment	136.36	168.91
A. GROSS INCOME	2483.71	2546.72
Concentrate	371.93	397.37
Roughage	409.26	421.32
Other Costs	521.46	527.45
Hired Labour	86.41	87.95
Family Labour	395.96	397.21
B. Variable Costs	1785.02	1831.29
Rent	46.24	17.53
Depreciation	173.14	192.35
Interest	104.77	149.54
C. Capital Cost	324.15	359.42
D. Production Cost (B+C)	2109.17	2190.71
GROSS RETURN	698.69	715.43
RETURN TO EQUITY	374.54	356.01
	Per hL of Milk Sold	
Milk Sales	43.08	43.60
Inventory Adjustment	2.50	3.10
A. GROSS INCOME	45.58	46.70
Feed Costs	14.34	15.01
Other Costs	9.46	10.26
Labour Cost	8.86	8.90
B. Variable Cost	32.66	34.17
Rent	0.95	0.32
Depreciation	3.18	3.53
Interest	1.92	2.74
C. Capital Cost	6.05	6.59
D. Production Cost	38.71	40.76
RETURN TO EQUITY	6.87	5.94
PER CENT RETURN TO EQUITY (%)	13.19	11.83

TABLE 9 COST OF PRODUCING MILK

Southern Alberta Average	1982	1983
No. of Cows	62.50	56.33
Milk Production Per Cow (L)	5807	5863
Capital Investment per Cow ($)	4310	4188
	Per Cow	
Milk Sales	2460.95	2497.70
Inventory Adjustment	127.80	127.18
A. GROSS INCOME	2588.75	2624.88
Concentrate	450.36	465.34
Roughage	467.69	496.72
Other Costs	559.00	544.16
Hired Labour	159.14	126.04
Family Labour	291.78	388.12
B. Variable Costs	1927.97	2020.38
Rent	51.18	19.40
Depreciation	168.09	177.74
Interest	88.86	146.49
C. Capital Cost	308.13	343.64
D. Production Cost (B+C)	2236.10	2364.02
GROSS RETURN	660.78	604.50
RETURN TO EQUITY	352.65	260.86
	Per hL of Milk Sold	
Milk Sales	43.50	44.14
Inventory Adjustment	2.26	2.25
A. GROSS INCOME	45.76	46.39
Feed Costs	16.23	17.00
Other Costs	9.88	10.07
Labour Cost	7.97	9.09
B. Variable Cost	34.08	36.16
Rent	0.91	0.34
Depreciation	2.97	3.14
Interest	1.57	2.59
C. Capital Cost	5.45	6.07
D. Production Cost	39.53	42.23
RETURN TO EQUITY	6.23	4.15
PER CENT RETURN TO EQUITY (%)	11.24	8.60

TABLE 10: COST OF PRODUCTION CHANGES RELATED TO CHANGE INDUCED BY THE FORMULA

(in $/hL)	1982	1983	% CHANGE	FORMULA INDEX CHANGE
Milk Price (PUB Class 1)	44.54	46.39	+4.15	+3.70[1]
Milk Price (Blend)	43.28	43.83	+1.27	-
Inventory Adjustment	2.39	2.74	+14.64	-
Production Cost	39.20	41.62	+6.17	+2.65[2]
Return to Equity	6.47	4.94		

[1] Composite Index

[2] Supply Index

Management Factors

Dairy management is concerned with the organizing, planning, directing and supervising of a dairy business. Dairy farmers carry out these functions. In addition, many farmers provide their own labour.

Table 11 shows average levels of the management factors which influenced income for the province. The figures from the previous year are included for comparison.

Productivity -- Milk production per cow in the 1983 sample increased by only 0.6 per cent compared with 1982 production. The productivity of other resources such as labour and capital remained also almost unchanged over the previous year. The number of litres of milk produced per hour of work was 70.9 in 1983. While milk produced per pound of feed was unchanged over the previous year, the milk production per dollar of capital decreased from 1.37 litres to 1.35 litres.

Intensity -- The intensity of resource use measures the extent to which a farm resource has been used in production. It is commonly expressed on a per acre basis, but in the case of dairy farming, the

TABLE 11 MANAGEMENT INDICATORS IN MILK PRODUCTION

Alberta Average	1982	1983
A. Productivity		
Milk Production per Cow	5671.23 L	5704.73 L
Milk Production per Work Hour	70.48 L	70.87 L
Milk/Feed Ratio	1.97 L	1.97 L
Milk/Capital Ratio	1.37 L	1.35 L
B. Intensity		
Concentrate Fed per Cow	2.88 t	2.89 t
Roughage Fed per Cow	5.82 t	5.68 t
Investment per Cow	4126.27	4236.08
Acres per Cow	8.83	6.49
Labour Hours per Cow	80.48	80.49
C. Efficiency		
Cost/Revenue Ratio	.86	0.89
Feed/Revenue Ratio	.33	0.34
Labour/Revenue Ratio	.19	0.20
Capital Turnover (years)	1.63	1.64
D. Rate of Returns		
Return on Equity (%)	12.04	10.01
Return to Family Labour ($/hr.)	6.33	5.88

appropriate unit is the cow. The results show that in 1983 the quantity of concentrate fed was unchanged over the previous year, but the roughage fed was reduced. The capital value per cow in 1983 was $4236 per cow.

Efficiency — The efficiency of production is measured in value of resource use per dollar of income received. In 1983, an average fluid milk producer spent 34 cents on feed and 20 cents on labour for each income dollar received. Total costs accounted for 89 cents for each dollar of income, slightly higher compared with 1982. It takes 1.6 years of dairy revenue to recover the 1983 capital investment value.

Management Groups

Every farm operator tries to make management decisions that maximize the return on his farm. In the following table we attempted to identify the top management group and compare them with the standard or average group.

Five factors were selected to measure the level of management:

1. Milk Production Per Cow
2. Total Cost Per Litre of Milk
3. Milk Production For Hour of Labour
4. Milk Production Per Dollar Of Feed
5. Milk Production For Dollar Of Investment

The average value for each management factor was determined for the total sample of producers. The top management group (15% of producers) consists of producers who exceeded average in at least four factors. In other words the producer who exceeded average in the first four factors and was below average in the fifth factor or any other combination of four factors would qualify for this group.

The findings, as displayed in Table 12, show the magnitude of the difference between the top group and the standard group. The milk production and cost of production were better by 13 and 15 per cent respectively. Along with the five management factors several additional factors are listed for comparison.

TABLE 12 MANAGEMENT GROUPS

	STANDARD GROUP	TOP (15%) GROUP
Milk Production Per Cow (L)	5705	6457
Cost For hL of Milk	41.62	35.44
Milk Production Per Work Hour (L)	70.90	132.60
Milk Per Dollar Of Feed (L)	6.50	8.20
Milk Per Dollar Of Capital (L)	1.40	1.80
Butter Fat Test (kg/hL)	3.65	3.62
Feed Cost Per Cow	878.30	833.40
Hours of Labour Per Cow	80.50	78.50
Milk/Feed Ratio	1.97	2.07
Investment Per Cow	4236	3852
Per Cent Dry Cows	18.20	17.50
Debt/Capital Ratio	0.35	0.10
Size of Operation (No. Cows)	54.70	44.70
Years Farming	15.4	21.6

APPENDIX A - ALBERTA COMPUTER PRINTOUT

ALBERTA AVERAGE (57)

TABLE 1 : ***** SUMMARY OF DAIRY ENTERPRISE COSTS AND RETURNS *****

	TOTAL ENTERPRISE	PER COW	PER HL. SOLD
------ INCOME ------			
MILK SALES	128301.44	2345.16	42.34
NET SUBSIDY AND OTHER (+-)	4509.25	82.42	1.49
NET CATTLE SALES (+-)	8609.41	157.37	2.84
NET INVENTORY INCREASE (+-)	-317.19	-5.80	-0.10
GROSS INCOME	141102.87	2579.15	46.56
----- EXPENSES -----			
GRAIN	6306.84	115.28	2.08
COMPLETE FEED	14550.02	265.95	4.80
SUPPLEMENT	1320.20	24.13	0.44
SALT, MINERALS, VITAMINS	627.33	11.47	0.21
ROUGHAGE	23082.34	421.91	7.62
PASTURE	1681.19	30.73	0.55
PROCESSING COSTS	480.35	8.78	0.16
TOTAL FEED COSTS	48048.26	878.25	15.86
BEDDING AND SUPPLIES	3375.96	61.71	1.11
VET., MEDICINE AND BREEDING	3195.42	58.41	1.05
ENERGY	5735.00	104.83	1.89
BLDG. & MACH. UPKEEP	5450.79	99.63	1.80
TAXES AND INSURANCE	1615.59	29.53	0.53
MILK HAULING & PROMOTION	8007.91	146.37	2.64
MISCELLANEOUS	3470.88	63.44	1.15
TOTAL OTHER COSTS	30851.55	534.39	10.18
HIRED LABOR	5683.29	103.88	1.88
FAMILY LABOR	22258.41	406.85	7.35
TOTAL LABOR COSTS	27941.70	510.73	9.22
TOTAL OPERATING COSTS	106841.44	1923.37	35.26
RENT	1001.66	18.31	0.33
DEPRECIATION	10181.76	186.11	3.36
INTEREST (CAP.DEBT)	8104.12	148.13	2.67
TOTAL CAPITAL COSTS	19287.55	352.55	6.36
****TOTAL PRODUCTION COST****	126128.94	2275.92	41.62
GROSS RETURN	34261.44	655.78	11.31
RETURN TO EQUITY	14973.89	303.23	4.94
SALE PRICE			43.83
INVENTORY ADJUSTMENT			2.74

ALBERTA AVERAGE (57)

TABLE 2 : ***** MANAGEMENT FACTORS *****

------ PRODUCTIVITY ------		
MILK PRODUCTION PER COW	5704.73	LITRES
MILK PRODUCTION PER WORK HOUR	70.87	LITRES
MILK/FEED RATIO	1.97	LITRES
MILK/CAPITAL RATIO	1.35	LITRES
------- INTENSITY -------		
CONCENTRATE FED PER COW	2.89	TONNES
ROUGHAGE FED PER COW	5.68	TONNES
INVESTMENT PER COW	4236.08	
ACRES OF LAND PER COW	6.49	
LABOR HOURS PER COW	80.49	
------ EFFICIENCY ------		
TOTAL COST PER DOLLAR OF INCOME	0.89	
FEED COST PER DOLLAR OF INCOME	0.34	
LABOR COST PER DOLLAR OF INCOME	0.20	
CAPITAL TURNOVER	1.64	YEARS
---- RATES OF RETURN ----		
EQUITY INTEREST	10.01	%
PAID INTEREST	9.86	%
RETURN TO FAMILY LABOR	5.88	$/HR.
RETURN PER RECEIPTS	11.76	%

ALBERTA AVERAGE (57)

TABLE 3 : STATEMENT OF INVESTMENT

LAND BUILDINGS & EQUIPMENT	% USE TO DAIRY	TOTAL FARM INVESTMENT	AGE	DAIRY INVESTMENT
LAND	1.10	346040.69		3819.84
DAIRY BUILDINGS	100.00	75996.12	10.04	75996.12
CROP BUILDINGS		7237.21		
OTHER BUILDINGS	16.73	53792.03		8997.64
TRACTOR, TRUCK & AUTO.	27.86	55702.47		15520.13
CROP EQUIPMENT		30101.96		
DAIRY EQUIPMENT	100.00	22996.36	5.81	22996.36
OTHER EQUIPMENT	50.49	2570.34		1297.69
TOTAL		594437.00		128627.62
DEPRECIATION		24005.56		10181.76

-- DAIRY LIVESTOCK --	BEGIN YEAR NUMBER	BEGIN YEAR VALUE	END 1983 NUMBER	END 1983 VALUE	AVERAGE VALUE
COWS	55.54	75874.31	55.00	75132.62	75503.44
BRED HEIFERS	13.82	13133.33	12.47	11850.00	12491.66
OPEN HEIFERS	14.09	7043.86	16.65	8324.56	7684.21
HEIFER CALVES	20.54	4131.58	22.14	4445.61	4288.59
BULL CALVES	7.21	360.53	8.21	410.53	385.53
BULLS	0.67	800.00	0.72	863.16	831.58
SUBTOTAL	111.88	101343.50	115.19	101026.31	101184.87
OTHER LIVESTOCK		5725.96		8584.56	7155.26
CROPS & SUPPLIES		28894.45		29297.28	29095.86

TOTAL FARM INVESTMENT	731872.94
CAPITAL LOANS: TOTAL FARM	161393.56
TOTAL DAIRY INVESTMENT	231752.25
CAPITAL LOANS: DAIRY	82180.12
OPERATOR EQUITY: DAIRY	149572.12
DEBT/CAPITAL RATIO	0.35

ALBERTA AVERAGE (57)

TABLE 4 : ***** LABOR AND PRODUCTION REPORT *****

------- LABOR --------	-----DAIRY----- HOURS	VALUE	-----OTHER----- HOURS	VALUE
OPERATOR LABOR	2102.19	15070.83	1147.08	8223.52
HIRED LABOR	1123.52	5683.29	785.09	3971.34
FAMILY UNPAID LABOR	1178.04	7187.59	601.10	3667.47
TOTAL	4403.75	27941.70	2533.26	15862.32

-- MILK PRODUCTION ---	HL.	% OF TOTAL	$	AVERAGE VALUE
QUOTA MILK	2319.06	74.31	102789.94	44.32
OVER QUOTA MILK	692.27	22.18	24738.03	35.73
OTHER MILK SALES	5.76	0.18	215.76	37.48
FED CALVES	90.74	2.91	3841.89	42.34
USED IN HOME	13.17	0.42	557.77	42.34
TOTAL	3121.00	100.00	132143.31	42.34

--------OTHER---------	
NUMBER OF DAIRY COWS	54.71
NUMBER OF DRY COWS	9.96
ANIMAL UNITS	85.25
BUTTERFAT TEST	3.65
MAN EQUIVALENTS(DAIRY)	1.76
LABOR COSTS PER HOUR	6.34
CALF CROP (%)	78.95
QUOTA SIZE (L)	648.64
YEARS FARMING	15.42

ALBERTA AVERAGE (57)

TABLE 5 : ***** FEED REPORT *****

CONCENTRATES	PURCHASED QUANTITY (TONNES)	PURCHASED PRICE	PURCHASED VALUE	HOMEGROWN QUANTITY (TONNES)	HOMEGROWN PRICE	HOMEGROWN VALUE
OATS	0.89	77.26	68.59	7.14	86.21	615.57
BARLEY	5.10	100.58	513.15	20.35	88.92	1809.16
WHEAT	0.06	153.89	9.72	0.06	82.91	4.65
MIXED GRAIN	5.33	123.41	657.84	27.44	82.12	2253.30
(DRY)BREW GRAIN	2.32	101.57	235.61			
BEET PULP	1.43	97.30	139.25			
(DRY) STILLAGE						
SUBTOTAL	15.13		1624.17	54.98		4682.68
DAIRY RATION	80.67	174.28	14059.18			
CALF FEED	1.74	281.65	490.84			
SUPPLEMENT	4.40	300.18	1320.20			
SALT	0.42	254.44	106.08			
MINERALS & VITAMINS	0.79	657.02	521.25			
TOTAL CONCENTRATES	103.16		18121.70	54.98		4682.68
ROUGHAGES						
ALFALFA HAY	58.94	81.47	4801.69	170.58	74.82	12762.72
ALFALFA PELLETS	0.02	118.00	2.28			
STRAW FED	0.31	38.57	11.82	0.55	23.28	12.80
(DRY) SILAGE	6.21	81.70	506.99	71.80	67.59	4852.82
GREENFEED	0.38	48.04	18.09	2.20	51.54	113.14
SUBTOTAL	65.85		5340.86	245.13		17741.48
PASTURE (AUM.)				169.24		1681.19
GRINDING			480.35			
GRAND TOTAL FEED COSTS			23942.91			24105.35
BEDDING STRAW	12.11	24.72	299.37	30.97	23.63	732.01

APPENDIX B - NORTHERN ALBERTA COMPUTER PRINTOUT

NORTHERN ALBERTA AVERAGE (34)

TABLE 1 : ***** SUMMARY OF DAIRY ENTERPRISE COSTS AND RETURNS *****

	TOTAL ENTERPRISE	PER COW	PER HL. SOLD
------ INCOME ------			
MILK SALES	122597.75	2286.62	41.93
NET SUBSIDY AND OTHER (+-)	4889.28	91.19	1.67
NET CATTLE SALES (+-)	7785.87	145.22	2.66
NET INVENTORY INCREASE (+-)	1270.00	23.69	0.43
GROSS INCOME	136542.87	2546.72	46.70
----- EXPENSES -----			
GRAIN	5691.02	106.15	1.95
COMPLETE FEED	13280.96	247.71	4.54
SUPPLEMENT	1075.84	20.07	0.37
SALT, MINERALS, VITAMINS	755.94	14.10	0.26
ROUGHAGE	20719.28	386.44	7.09
PASTURE	1869.88	34.88	0.64
PROCESSING COSTS	501.35	9.35	0.17
TOTAL FEED COSTS	43894.27	818.69	15.01
BEDDING AND SUPPLIES	3602.46	67.19	1.23
VET., MEDICINE AND BREEDING	3088.21	57.60	1.06
ENERGY	5897.91	110.00	2.02
BLDG. & MACH. UPKEEP	4953.43	92.39	1.69
TAXES AND INSURANCE	1722.68	32.13	0.59
MILK HAULING & PROMOTION	8076.68	150.64	2.76
MISCELLANEOUS	2660.64	49.62	0.91
TOTAL OTHER COSTS	30002.02	527.45	10.26
HIRED LABOR	4715.23	87.95	1.61
FAMILY LABOR	21296.29	397.21	7.28
TOTAL LABOR COSTS	26011.53	485.15	8.90
TOTAL OPERATING COSTS	99907.75	1831.29	34.17
RENT	939.99	17.53	0.32
DEPRECIATION	10312.73	192.35	3.53
INTEREST (CAP.DEBT)	8017.35	149.54	2.74
TOTAL CAPITAL COSTS	19270.06	359.41	6.59
****TOTAL PRODUCTION COST****	119177.81	2190.71	40.76
GROSS RETURN	36635.12	715.43	12.53
RETURN TO EQUITY	17365.06	356.01	5.94
SALE PRICE			43.60
INVENTORY ADJUSTMENT			3.10

NORTHERN ALBERTA AVERAGE (34)

TABLE 2 : ***** MANAGEMENT FACTORS *****

------ PRODUCTIVITY ------		
MILK PRODUCTION PER COW	5592.58	LITRES
MILK PRODUCTION PER WORK HOUR	65.18	LITRES
MILK/FEED RATIO	2.05	LITRES
MILK/CAPITAL RATIO	1.31	LITRES
------- INTENSITY -------		
CONCENTRATE FED PER COW	2.73	TONNES
ROUGHAGE FED PER COW	5.45	TONNES
INVESTMENT PER COW	4271.25	
ACRES OF LAND PER COW	7.22	
LABOR HOURS PER COW	85.80	
------ EFFICIENCY ------		
TOTAL COST PER DOLLAR OF INCOME	0.87	
FEED COST PER DOLLAR OF INCOME	0.32	
LABOR COST PER DOLLAR OF INCOME	0.19	
CAPITAL TURNOVER	1.68	YEARS
---- RATES OF RETURN ----		
EQUITY INTEREST	11.83	%
PAID INTEREST	9.75	%
RETURN TO FAMILY LABOR	5.88	$/HR.
RETURN PER RECEIPTS	13.98	%

NORTHERN ALBERTA AVERAGE (34)

TABLE 3 : STATEMENT OF INVESTMENT

LAND BUILDINGS & EQUIPMENT	% USE TO DAIRY	TOTAL FARM INVESTMENT	AGE	DAIRY INVESTMENT
LAND	1.06	268808.62		2858.67
DAIRY BUILDINGS	100.00	78622.87	9.11	78622.87
CROP BUILDINGS		7024.31		
OTHER BUILDINGS	14.44	56746.25		8195.59
TRACTOR, TRUCK & AUTO.	24.92	63342.62		15784.58
CROP EQUIPMENT		33032.75		
DAIRY EQUIPMENT	100.00	23976.02	5.29	23976.02
OTHER EQUIPMENT	43.78	1902.57		833.00
TOTAL		533455.94		130270.56
DEPRECIATION		25631.52		10312.73

-- DAIRY LIVESTOCK --	BEGIN YEAR NUMBER	BEGIN YEAR VALUE	END 1983 NUMBER	END 1983 VALUE	AVERAGE VALUE
COWS	53.94	72875.75	53.71	72678.12	72776.94
BRED HEIFERS	12.71	12070.59	13.13	11511.47	11791.17
OPEN HEIFERS	12.50	6250.00	15.03	7514.70	6882.35
HEIFER CALVES	18.62	3761.76	21.85	4400.00	4080.88
BULL CALVES	6.59	329.41	7.65	382.35	355.88
BULLS	0.76	917.65	0.82	988.24	952.94
SUBTOTAL	105.12	96205.06	111.18	97475.06	96840.06
OTHER LIVESTOCK		2942.06		4495.59	3718.82
CROPS & SUPPLIES		26225.55		25312.79	25769.17

TOTAL FARM INVESTMENT	659783.94
CAPITAL LOANS: TOTAL FARM	169700.81
TOTAL DAIRY INVESTMENT	229003.87
CAPITAL LOANS: DAIRY	82268.87
OPERATOR EQUITY: DAIRY	146735.00
DEBT/CAPITAL RATIO	0.36

NORTHERN ALBERTA AVERAGE (34)

TABLE 4 : ***** LABOR AND PRODUCTION REPORT *****

------- LABOR --------	-----DAIRY----- HOURS	VALUE	-----OTHER----- HOURS	VALUE
OPERATOR LABOR	2119.82	14939.28	1293.13	9113.24
HIRED LABOR	1019.21	4715.23	693.79	3209.73
FAMILY UNPAID LABOR	1460.93	6357.02	884.49	3848.72
TOTAL	4599.96	26011.53	2871.41	16171.68

-- MILK PRODUCTION ---	HL.	% OF TOTAL	$	AVERAGE VALUE
QUOTA MILK	2141.56	71.42	94575.12	44.16
OVER QUOTA MILK	764.83	25.51	27304.66	35.70
OTHER MILK SALES	5.00	0.17	186.87	37.41
FED CALVES	74.42	2.48	3120.19	41.93
USED IN HOME	12.67	0.42	531.24	41.93
TOTAL	2998.47	100.00	125717.94	41.93

--------OTHER---------	
NUMBER OF DAIRY COWS	53.62
NUMBER OF DRY COWS	10.20
ANIMAL UNITS	82.46
BUTTERFAT TEST	3.65
MAN EQUIVALENTS(DAIRY)	1.84
LABOR COSTS PER HOUR	5.65
CALF CROP (%)	82.12
QUOTA SIZE (L)	599.26
YEARS FARMING	15.00

NORTHERN ALBERTA AVERAGE (34)

TABLE 5 : ***** FEED REPORT *****

CONCENTRATES	PURCHASED QUANTITY (TONNES)	PURCHASED PRICE	PURCHASED VALUE	HOMEGROWN QUANTITY (TONNES)	HOMEGROWN PRICE	HOMEGROWN VALUE
OATS	0.99	68.09	67.69	6.07	79.86	484.78
BARLEY	4.84	90.22	436.94	20.89	86.80	1813.12
WHEAT	0.11	153.89	16.29	0.09	82.91	7.80
MIXED GRAIN	2.71	131.06	354.98	29.80	77.62	2313.04
(DRY)BREW GRAIN						
BEET PULP	1.14	171.78	196.38			
(DRY) STILLAGE						
SUBTOTAL	9.79		1072.29	56.85		4618.73
DAIRY RATION	74.00	176.42	13055.62			
CALF FEED	0.83	272.71	225.35			
SUPPLEMENT	3.38	318.45	1075.84			
SALT	0.48	264.03	127.19			
MINERALS & VITAMINS	0.96	655.20	628.75			
TOTAL CONCENTRATES	89.44		16185.02	56.85		4618.73
ROUGHAGES						
ALFALFA HAY	49.67	72.58	3604.77	164.49	73.29	12056.15
ALFALFA PELLETS	0.03	118.00	3.82			
STRAW FED	0.40	39.82	15.76	0.92	23.28	21.46
(DRY) SILAGE	6.78	65.82	446.25	67.77	65.66	4450.05
GREENFEED				2.41	50.22	121.02
SUBTOTAL	56.87		4070.60	235.59		16648.68
PASTURE (AUM.)				188.20		1869.88
GRINDING			501.35			
GRAND TOTAL FEED COSTS			20756.98			23137.29
BEDDING STRAW	12.75	20.30	258.79	31.13	23.44	729.55

APPENDIX C - SOUTHERN ALBERTA COMPUTER PRINTOUT

SOUTHERN ALBERTA AVERAGE (23)

TABLE 1 : ***** SUMMARY OF DAIRY ENTERPRISE COSTS AND RETURNS *****

	TOTAL ENTERPRISE	PER COW	PER HL. SOLD
------ INCOME ------			
MILK SALES	136738.44	2427.62	42.90
NET SUBSIDY AND OTHER (+-)	3947.59	70.08	1.24
NET CATTLE SALES (+-)	9826.82	174.46	3.08
NET INVENTORY INCREASE (+-)	-2663.44	-47.29	-0.84
GROSS INCOME	147849.37	2624.88	46.39
----- EXPENSES -----			
GRAIN	7217.32	128.13	2.26
COMPLETE FEED	16426.05	291.62	5.15
SUPPLEMENT	1681.46	29.85	0.53
SALT, MINERALS, VITAMINS	437.22	7.76	0.14
ROUGHAGE	26575.67	471.82	8.34
PASTURE	1402.29	24.90	0.44
PROCESSING COSTS	449.30	7.98	0.14
TOTAL FEED COSTS	54189.31	962.06	17.00
BEDDING AND SUPPLIES	3041.22	53.99	0.95
VET., MEDICINE AND BREEDING	3353.95	59.55	1.05
ENERGY	5494.30	97.54	1.72
BLDG. & MACH. UPKEEP	6186.07	109.83	1.94
TAXES AND INSURANCE	1457.30	25.87	0.46
MILK HAULING & PROMOTION	7906.40	140.37	2.48
MISCELLANEOUS	4668.62	82.89	1.46
TOTAL OTHER COSTS	32107.86	544.16	10.07
HIRED LABOR	7099.43	126.04	2.23
FAMILY LABOR	21861.19	388.12	6.86
TOTAL LABOR COSTS	28960.62	514.16	9.09
TOTAL OPERATING COSTS	115257.69	2020.39	36.16
RENT	1092.84	19.40	0.34
DEPRECIATION	10011.54	177.74	3.14
INTEREST (CAP.DEBT)	8251.46	146.49	2.59
TOTAL CAPITAL COSTS	19355.84	343.64	6.07
****TOTAL PRODUCTION COST****	134613.50	2364.02	42.23
GROSS RETURN	32591.69	604.50	10.23
RETURN TO EQUITY	13235.85	260.86	4.15
SALE PRICE			44.14
INVENTORY ADJUSTMENT			2.25

SOUTHERN ALBERTA AVERAGE (23)

TABLE 2 : *** MANAGEMENT FACTORS *****

------ PRODUCTIVITY ------		
MILK PRODUCTION PER COW	5862.53	LITRES
MILK PRODUCTION PER WORK HOUR	80.27	LITRES
MILK/FEED RATIO	1.88	LITRES
MILK/CAPITAL RATIO	1.40	LITRES
------- INTENSITY -------		
CONCENTRATE FED PER COW	3.12	TONNES
ROUGHAGE FED PER COW	6.01	TONNES
INVESTMENT PER COW	4187.66	
ACRES OF LAND PER COW	5.46	
LABOR HOURS PER COW	73.03	
------ EFFICIENCY ------		
TOTAL COST PER DOLLAR OF INCOME	0.91	
FEED COST PER DOLLAR OF INCOME	0.37	
LABOR COST PER DOLLAR OF INCOME	0.20	
CAPITAL TURNOVER	1.60	YEARS
---- RATES OF RETURN ----		
EQUITY INTEREST	8.60	%
PAID INTEREST	10.06	%
RETURN TO FAMILY LABOR	5.87	$/HR.
RETURN PER RECEIPTS	9.94	%

SOUTHERN ALBERTA AVERAGE (23)

TABLE 3 : STATEMENT OF INVESTMENT

LAND BUILDINGS & EQUIPMENT	% USE TO DAIRY	TOTAL FARM INVESTMENT	AGE	DAIRY INVESTMENT
LAND	1.14	460210.37		5240.71
DAIRY BUILDINGS	100.00	72113.06	11.43	72113.06
CROP BUILDINGS		7551.93		
OTHER BUILDINGS	20.65	49424.97		10206.06
TRACTOR, TRUCK & AUTO.	34.13	44408.31		15158.71
CROP EQUIPMENT		25769.49		
DAIRY EQUIPMENT	100.00	21548.18	6.58	21548.18
OTHER EQUIPMENT	55.99	3557.47		1991.73
TOTAL		684583.56		126258.25
DEPRECIATION		21601.99		10011.54

	-----BEGIN YEAR-----		-----END 1983-----		AVERAGE
-- DAIRY LIVESTOCK --	NUMBER	VALUE	NUMBER	VALUE	VALUE
COWS	57.91	80307.00	56.91	78761.00	79534.00
BRED HEIFERS	15.48	14704.35	13.00	12350.00	13527.17
OPEN HEIFERS	17.43	8217.39	19.04	9521.74	8869.56
HEIFER CALVES	23.39	4678.26	22.57	4513.04	4595.65
BULL CALVES	8.13	406.52	9.04	452.17	429.35
BULLS	0.52	626.09	0.57	678.26	652.17
SUBTOTAL	121.87	108939.50	121.13	106276.06	107607.75
OTHER LIVESTOCK		9841.30		14629.13	12235.21
CROPS & SUPPLIES		32839.78		35187.39	34013.56
TOTAL FARM INVESTMENT					838440.06
CAPITAL LOANS: TOTAL FARM					149113.25
TOTAL DAIRY INVESTMENT					235874.50
CAPITAL LOANS: DAIRY					82048.94
OPERATOR EQUITY: DAIRY					153825.56
DEBT/CAPITAL RATIO					0.35

SOUTHERN ALBERTA AVERAGE (23)

TABLE 4 : ***** LABOR AND PRODUCTION REPORT *****

------- LABOR --------	-----DAIRY----- HOURS	VALUE	-----OTHER----- HOURS	VALUE
OPERATOR LABOR	2076.13	15259.29	931.17	6844.00
HIRED LABOR	1277.71	7099.43	920.04	5112.10
FAMILY UNPAID LABOR	759.87	6601.91	182.17	1582.77
TOTAL	4113.71	28960.62	2033.39	13538.86

-- MILK PRODUCTION ---	HL.	% OF TOTAL	$	AVERAGE VALUE
QUOTA MILK	2581.46	78.18	114935.87	44.52
OVER QUOTA MILK	585.01	17.72	20947.11	35.81
OTHER MILK SALES	6.88	0.21	258.46	37.56
FED CALVES	114.86	3.48	4927.82	42.90
USED IN HOME	13.92	0.42	597.06	42.90
TOTAL	3302.13	100.00	141666.25	42.90

---------OTHER---------	
NUMBER OF DAIRY COWS	56.33
NUMBER OF DRY COWS	9.60
ANIMAL UNITS	89.38
BUTTERFAT TEST	3.66
MAN EQUIVALENTS(DAIRY)	1.65
LABOR COSTS PER HOUR	7.04
CALF CROP (%)	74.49
QUOTA SIZE (L)	721.63
YEARS FARMING	16.04

SOUTHERN ALBERTA AVERAGE (23)

TABLE 5 : ***** FEED REPORT *****

CONCENTRATES	PURCHASED QUANTITY (TONNES)	PURCHASED PRICE	PURCHASED VALUE	HOMEGROWN QUANTITY (TONNES)	HOMEGROWN PRICE	HOMEGROWN VALUE
OATS	0.73	95.69	69.92	8.72	92.74	808.91
BARLEY	5.48	114.11	625.82	19.54	92.28	1803.37
WHEAT						
MIXED GRAIN	9.21	120.08	1105.56	23.94	90.42	2165.06
(DRY)BREW GRAIN	5.75	101.57	583.91			
BEET PULP	1.86	29.51	54.79			
(DRY) STILLAGE						
SUBTOTAL	23.03		2439.99	52.21		4777.34
DAIRY RATION	90.53	171.68	15542.74			
CALF FEED	3.10	285.17	883.31			
SUPPLEMENT	5.91	284.74	1681.46			
SALT	0.32	233.18	74.87			
MINERALS & VITAMINS	0.55	661.75	362.35			
TOTAL CONCENTRATES	123.43		20984.71	52.21		4777.34
ROUGHAGES						
ALFALFA HAY	72.65	90.45	6571.10	179.59	76.88	13807.25
ALFALFA PELLETS						
STRAW FED	0.17	34.35	5.99			
(DRY) SILAGE	5.36	111.42	596.78	77.77	70.06	5448.24
GREENFEED	0.93	48.04	44.84	1.88	54.04	101.50
SUBTOTAL	79.11		7218.69	259.24		19356.98
PASTURE (AUM.)				141.21		1402.29
GRINDING			449.30			
GRAND TOTAL FEED COSTS			28652.70			25536.61
BEDDING STRAW	11.18	32.15	359.37	30.75	23.93	735.66

APPENDIX D - MONTHLY QUESTIONNAIRE

Q1

Production Economics Branch
7000 - 113 Street
Edmonton, Alberta
T6H 5T6
Tel: 427-5397 or 427-4003

DAIRY STUDY MONTHLY QUESTIONNAIRE

Name:_____ Month:_____ Year:_____

ALL INDIVIDUAL ACCOUNTS WILL BE KEPT CONFIDENTIAL.

Use your own actual situation and experience to estimate proportions to dairy as indicated. The dairy enterprise means everything associated with milking and dry cows and dairy young stock. It is important that the information be provided each month. Your milk production and values are obtained from the milk statements by this office.

Question	Total Farm	Dairy Portion
1. Liters of Milk sold other than to plant	XXXX	
2. Value of milk sold other than to plant	XXXX	
3. Liters of milk fed to young stock (not colostrum)	XXXX	
4. Liters of milk used in home	XXXX	
5. Veterinary, medicine and breeding expenses		
6. Livestock and dairy supplies		
7. Building, hardware, fence - repairs		
8. Dairy equipment - repairs	XXXXX	
9. Field equipment - repairs		XXXXX
10. Tractor, Truck - repairs (Estimate dairy portion_____%)		
11. Fuel, oil, grease (Estimate dairy portion_____%)		
12. Utilities (Estimate dairy portion_____%)		
13. Taxes paid this month		
14. Cash rent paid this month for:_____		
15. Insurances and Licenses (Dairy_____%)		
16. Interest only on Capital Loans (exclude principle)		
17. Interest only on Operating Loans (Dairy Portion _____%)		
18. Seed and Crop supplies (twine etc.)		XXXXX
19. Fertilizer and chemicals		XXXXX
20. Custom charges and other services for:_____		
21. Other Expenses (DHIA, Legal, Accounting etc.)		
22. Feed Puschases		
23. Feed grinding Charges		
24. a) Government Subsidies for milk	XXXX	
b) Other Government Subsidies		
c) C.W.B. Payment		XXXX
d) Crop Sales		XXXX
e) Misc. Income, specify:_____		

25. Labour Situation this Month:

	Dairy Chores	Other Work	Wages Paid incl. Board
a. Operator	Hr./day ____ x ____ days____	Hr/day ____ x ____ days____	XXXXX
b. Hired and Paid Family 1st)	Hours ____ x ____ days____	Hours ____ x ____ days____	
2nd)	Hours ____ x ____ days____	Hours ____ x ____ days____	
3rd)	Hours ____ x ____ days____	Hours ____ x ____ days____	
4th)	Hours ____ x ____ days____	Hours ____ x ____ days____	
c. Unpaid Labor 1st)	Hours ____ x ____ days____	Hours ____ x ____ days____	XXXXX
2nd)	Hours ____ x ____ days____	Hours ____ x ____ days____	XXXXX

26. Dairy Herd	Begin. No.	Sold No.	Sold Value	Purchased No.	Purchased Value	Home Use No.	Home Use Value	Trans. to Beef No.	Trans. to Beef Value	Born No.	Death No.	End No.
Dairy Cows Milking + Dry												
Bred Heifers												
Open Heifers												
Heifer Calves Under 12 mon.												
Bull Calves Under 7 mon.												
Herd Bulls												
Totals												

27. Other Livestock (beef, etc.): Sold $_____ Purchased $_____ Home Use $_____

28. Milking Cows Only No._____

29. Feed Fed to Dairy Herd:	Quantity of Feed Fed: weight per day x no. days -or- weight per month	Price if Purchased (per weight unit)
1. Bedding Straw	____ x ____ ____	$ ____/____
2.	____ x ____ ____	$ ____/____
3.	____ x ____ ____	$ ____/____
4.	____ x ____ ____	$ ____/____
5.	____ x ____ ____	$ ____/____
6.	____ x ____ ____	$ ____/____
7.	____ x ____ ____	$ ____/____
8.	____ x ____ ____	$ ____/____
9.	____ x ____ ____	$ ____/____

30. No. of dairy animals on pasture: Cows _____ Heifers _____ Calves _____

	Total Farm	Dairy Portion
31. Dairy equipment: a. purchases (specify: _____)		
b. sales (specify: _____)		
32. Field equipment: a. purchases (specify: _____)		XXXXX
b. sales (specify: _____)		XXXXX
33. Tractor, truck, auto. a. purchases (specify: _____)		
b. sales (specify: _____)		
34. a. Total cost for new bldg. (specify: _____)		
b. Buildings sold this month (specify: _____)		
35. Land: sold _____ acres, purchased _____ acres		XXXXX
36. Milk Quota: sold _____ Lit. purchased _____ Lit.		

APPENDIX E - ALBERTA PRICE FORMULA

Alberta is priced at the producer, wholesale and retail levels by the Board of Public Utilities. This is a common procedure, in that for many years, appointed bodies in Canada and the U.S.A. have issued pricing orders designed to ensure adequate supplies of milk for the consuming public. The orders are made, following public hearings at which producers, consumer and industry representatives make submissions. All systems incorporate some type of quota allocation among milk producers, which when associated with the first grade milk price, provides the incentive to maintain the flow of milk in the cold winter months as well as in the summer.

Formula Pricing

A modification of the above procedure is known as "formula pricing" whereby an equitable price for first grade milk is determined through the use of selected statistical indicators. As milk is considered an essential food in the modern diet, the interests of consumers as well as producers must be considered in the pricing mechanism. Thus an "economic formula", incorporating supply and demand components, is normally used, to determine the producer price.

Formula Development in Alberta

In 1973, the Production Economics Branch designed a formula process to permit a comparison with milk price levels over the previous ten years. It was adopted for experimentation over a 12 month period from August, 1973 to August, 1974. Upon presentation and discussion of the results at a hearing in Red Deer in August, 1974, the Utility Board ordered the Formula to be used as a pricing mechanism for a test period of one year starting in October, and to be accompanied with a cost of production program to monitor its suitability and to assess adjustments in the formula components, if required at the end of the period.

The Alberta Formula

The Alberta Formula consists of seven statistical factors or components. The first three represent the approximation of demand of the consumers. The last four represent producer's major cost components and therefore are a reflection of his willingness to sell. The weight given to each factor was established with reference to the actual cost structure on the supply side and relative demand elasticities was a guide for setting the weight of the demand side.

Components of the Alberta Formula

Components	Weighting
1. Index of consumer prices (Canada)	10
2. Average weekly industrial wages (Alberta)	16
3. Per capita sales of milk (Alberta)	14
4. Index of farm inputs (Western Canada)	20
5. Index of farm wages (Western Canada)	12
6. Price of alfalfa hay (Alberta)	14
7. Price of 16% dairy feed (Alberta)	14
COMPOSITE	100

Application

A base price of $21.04 per hectolitre for No. 1 milk was established as at August, 1973. This was determined from the results of the 1973 Dairy Cost Study and provided for a return of 15 per cent on sales income. The indices for the month of August, 1973 were converted to 100, which was then equated to the base price of $21.04. Subsequent monthly index conversions were then calculated relative to the base month, and subsequent monthly producer price levels were determined by multiplying the base price by the appropriate "combined indices".

Whenever the present Formula states a change of $0.49 per hl. above or below the existing No. 1 producer price, the Board of Public Utilities may made an adjustment of $0.98 to the producer and one cent per litre to the consumer.

The changes in the Formula price are calculated monthly by the Production Economics Branch, and are forwarded to the Public Utilities Board in time to allow for notification and price list adjustment by the milk processing firms for the succeeding month.

The current formula will be kept under observation and, subject to results of the cost study and observed statistical trends, will be reviewed from time to time.

Alberta Agriculture
Production Economics Branch

427-5397